

MONTANA FISH, WILDLIFE AND PARKS

FISHERIES DIVISION

Title: Environmental Assessment for the stocking of golden trout into 3 mountain lakes in the Big Hole drainage

PART 1. PROPOSED ACTION DESCRIPTION

A. Type of Proposed Action: Montana Fish, Wildlife and Parks (FWP) is proposing to introduce golden trout into Foolhen, Rainbow and Upper Lena lakes in the Big Hole River drainage. Foolhen Lake is located in the Alder Creek drainage (near Wise River), Rainbow Lake is located in the Rock Creek drainage (near Glen) and Upper Lena Lake is located in the Big Swamp Creek drainage (near Jackson). Currently Foolhen and Rainbow lakes are stocked on a 4 year rotation with westslope cutthroat trout. Upper Lena Lake has no stocking record but has been reported to have had a rainbow trout fishery in the past, but is currently fishless. All three lakes would be stocked by packing (backpack or stock) fish into the lakes rather than stocking via aircraft. There are no conservation populations of native westslope cutthroat trout in the drainages proposed for golden trout introduction nor any plans for restoring native species to the mainstem streams. The purpose for golden trout introduction is to provide additional diversity to mountain lake fisheries in the Big Hole River drainage. The current stocking of westslope cutthroat trout into Foolhen and Rainbow lakes would be stopped and changed to golden trout.

B. Project Location: Foolhen Lake is located in the West Pioneer Mountains in the Alder Creek drainage west of Wise River (T1N R12W Sec29). Rainbow Lake is located in the East Pioneer Mountains in the Rock Creek drainage west of Glen (T4S R10W Sec 6). Upper Lena Lake is located in Beaverhead Mountains in the Big Swamp Creek drainage west of Jackson (T6S R17W Sec 6). All three lakes are within the Beaverhead-Deerlodge National Forest.

C. Estimated Commencement Date: July 2014

D. Project Size (acres affected)

Developed/residential – 0 acres

Industrial – 0 acres

Open space/Woodlands/Recreation – 0 acres

Wetlands/Riparian – Foolhen Lake is 8.5 acres. Rainbow Lake is 10.2 acres. Upper Lena Lake is 7.8 acres

Floodplain – 0 acres

Irrigated Cropland – 0 acres

Dry Cropland – 0 acres

Forestry – 0 acres

Rangeland – 0 acres

E. Description of Project:

In the Big Hole River drainage there are 137 named lakes and many more unnamed lakes. These lakes range from 1 acre in size to 116 acres and in elevation from 6,300 ft to over 9,700 ft. Mountain lakes provide important fisheries for anglers, particularly backcountry anglers because of the solitude the lakes provide and often because of the quality of the fisheries they produce. Of the 137 named lakes in the Big Hole, 97 are reported to contain either self-sustaining or stocked fisheries (USFS 1992). FWP actively manages these lakes to provide public fishing opportunities. The lakes are periodically surveyed (Olsen 2010) to determine the status of the fishery and make management recommendations. In addition, FWP currently stocks 30 lakes in the drainage. These stocking are primarily done by air on a 4-year rotation. Typically lakes that are managed by stocking produce higher quality fisheries (i.e., larger sized fish) because the numbers of fish in the lake can be carefully regulated. Lakes that have self-sustaining populations of trout are prone to over population resulting in abundant but smaller sized fish. Lakes with self-sustaining populations are those where there is suitable spawning habitat present in the inlet or outlet stream or in the lake and the fish are able to self-perpetuate without the need of additional stocking to sustain the fishery. Of the 97 lakes that contain fish, 13 contain Yellowstone cutthroat trout, 21 contain rainbow trout, 10 contain rainbow x cutthroat hybrids, 9 contain brook trout, 1 contains golden trout, 4 contain grayling, 3 longnose suckers and the remaining contain a combination of species. Since 2008, FWP has only stocked westslope cutthroat trout in mountain lakes in the Big Hole with the exception of the one golden trout lake. All lakes in the Big Hole with other species besides golden trout and westslope are self-sustaining populations of fish.

Because there is only 1 lake in the Big Hole (Skytop Lake) that contains a golden trout fishery, FWP is seeking to increase the opportunities to catch this fish species in the Big Hole drainage. Golden trout are a highly sought after species because of their unique spotting pattern, brilliant coloration and longevity particularly when stocked in mountain lakes. The proposed action would include the introduction of golden trout to Foolhen, Rainbow and Upper Lena lakes. These fish would be packed into the lakes by people or by stock rather than by aircraft like most of the stocking of mountain lakes. The source of golden trout in Montana is Sylvan Lake in the Beartooth Mountains west of Billings, Montana. Fertilized eggs are collected from this lake every 6 years for stocking across multiple lakes in Montana. The golden trout population in Sylvan Lake has been genetically tested and verified to be non-hybridized with any other trout. The collected eggs are incubated in the Yellowstone Trout Hatchery in Big Timber, Montana before they are ready to be stocked, usually at about 2 inches long in September. Golden trout are native to the Kern River drainage in California (Behnke 1992). They have been stocked throughout the west primarily in mountain lakes. Golden trout have also shown to be long-lived in mountain lakes (>8 years) allowing them to obtain larger size. Golden trout occupy the same basic trophic niche as other commonly stocked trout in mountain lakes such as westslope cutthroat trout consuming primarily invertebrates such as pelagic zooplankton and more benthic invertebrates such as midges (Chironomidae), scuds (*Gammarus*), caddisflies (order Trichoptera), mayflies (order Ephemeroptera), damselflies and dragonflies (order Odonata), snails and occasionally bivalves such as fingernail clams. They also consume terrestrial insects such as ants and beetles that fall to the surface of the lake.

Foolhen Lake

Foolhen Lake (Figure 1) is located in the Alder Creek drainage which is a tributary to the Big Hole River near Wise River. The Alder Creek Drainage contains 3 mountain lakes that contain fish (Foolhen, Ferguson and Johanna) all of which are currently stocked with westslope cutthroat trout. Alder Creek contains a mixture of highly hybridized westslope cutthroat trout (60% westslope), brook trout, rainbow trout and sculpin. Foolhen Lake is located at an elevation of 7,162 ft. It has an extensive littoral area despite being relatively deep (reportedly 37 ft deep). The inlet stream flows through a wet bog before entering the lake. The stream is small and may go dry later in the summer. There is very little potential spawning habitat in the inlet stream because the stream substrate is mostly silt and sand and lacks gravel. The outlet stream also contains very limited spawning potential. On its northwest shore there is a floating bog and there are lily pads around the margins of most of the lake. It is one of the most productive lakes in the Big Hole drainage (McMullin 1983). The lake has an extensive stocking history dating back as far as 1938. Yellowstone cutthroat trout, rainbow trout and westslope cutthroat trout have all been stocked at one time in the lake. The lake has been surveyed 4 times in the past (McMullin 1983, Olsen 2010) to evaluate the status of the fishery and effectiveness of the stocking. All past sampling including the most recent survey indicates that the lake does not support any natural reproduction. More recently the lake has been stocked on a 4-year rotation with 1,000 westslope cutthroat trout. This stocking rate was decreased in 2012 to 600 fish because the condition and size of the fish captured during 2010 sampling indicated the fish numbers were exceeding their food supply and growth was slow. Foolhen Lake is one of 3 lakes in the Big Hole drainage with special regulations limiting fish harvest because of its potential to grow large fish. The lake is only accessible by foot, although motorized access is present near the lake on Trail 735.

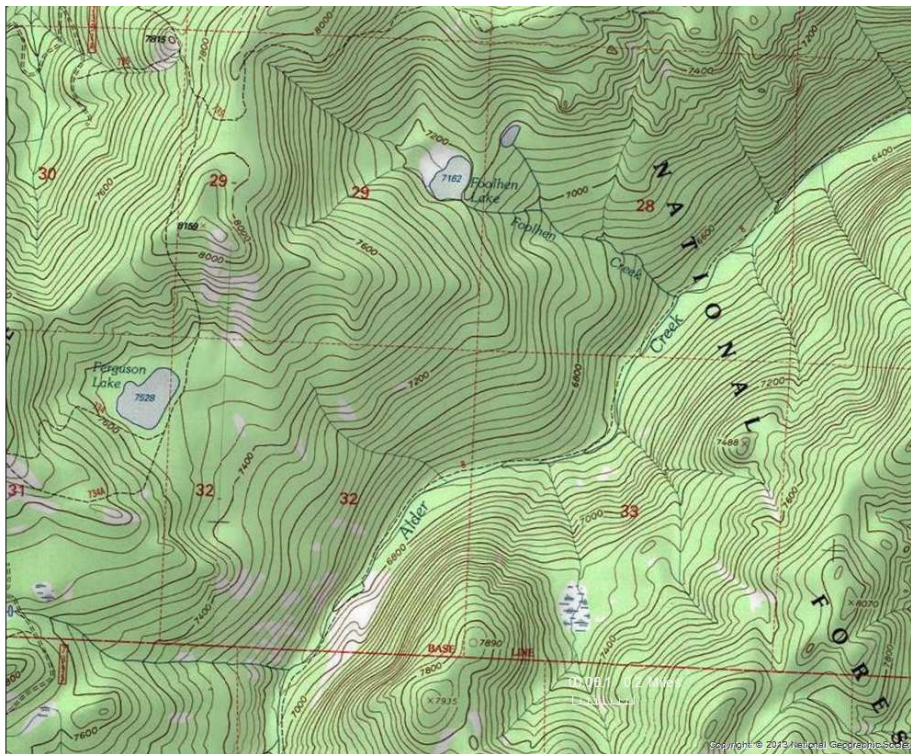


Figure 1. Map detailing Foolhen Lake and surrounding area and lakes.



Figure 2. Foolhen Lake 2010 looking in northwest from the south shore of the lake.

Rainbow Lake

Rainbow Lake is located in the East Pioneer Mountains in the Rock Creek drainage near Glen, Montana (Figure 3). Within the Rock Creek drainage there are 6 mountain lakes that contain fish. Brownes Lake located on the mainstem of Rock Creek contains self-sustaining populations of brook trout, brown trout, rainbow trout and cutthroat trout. Lake Agnes contains an introduced and self-sustaining population of Arctic grayling. Rainbow Lake is stocked on a 4 year rotation with westslope cutthroat trout. Long Branch Lake contains a self-sustaining population of rainbow x Yellowstone cutthroat trout hybrids. Waukena Lake is stocked with westslope cutthroat trout and Green Lake contains a self-sustaining population of rainbow trout. Rock Creek contains a mixed trout fishery of rainbow, brook and cutthroat trout.

Rainbow Lake is located at an elevation of 7,860 ft and is northwest of Lake Agnes. The habitat in the lake is very similar to that of Foolhen Lake with a well developed littoral area around the margins of the lakes with lily pads yet the lake has a maximum depth of 37 ft. There is very little flow into and out of the lake and the stream only flows during high flow periods or during wet years. There is no record of the lake having been surveyed in the past, but it has an extensive stocking record beginning in 1942 when the lake was stocked with rainbow trout. The lake was stocked periodically through the years with undesignated cutthroat trout until the late 1980's when Yellowstone cutthroat trout were stocked on a 4-year rotation. In 2008, the species stocked in the lake was changed to westslope cutthroat trout and the lake is stocked every 4-years

with 1,000 fry. The lake was surveyed in 2012. A gill net was set for 3 hours but no fish were captured; however fish were observed rising in the lake.

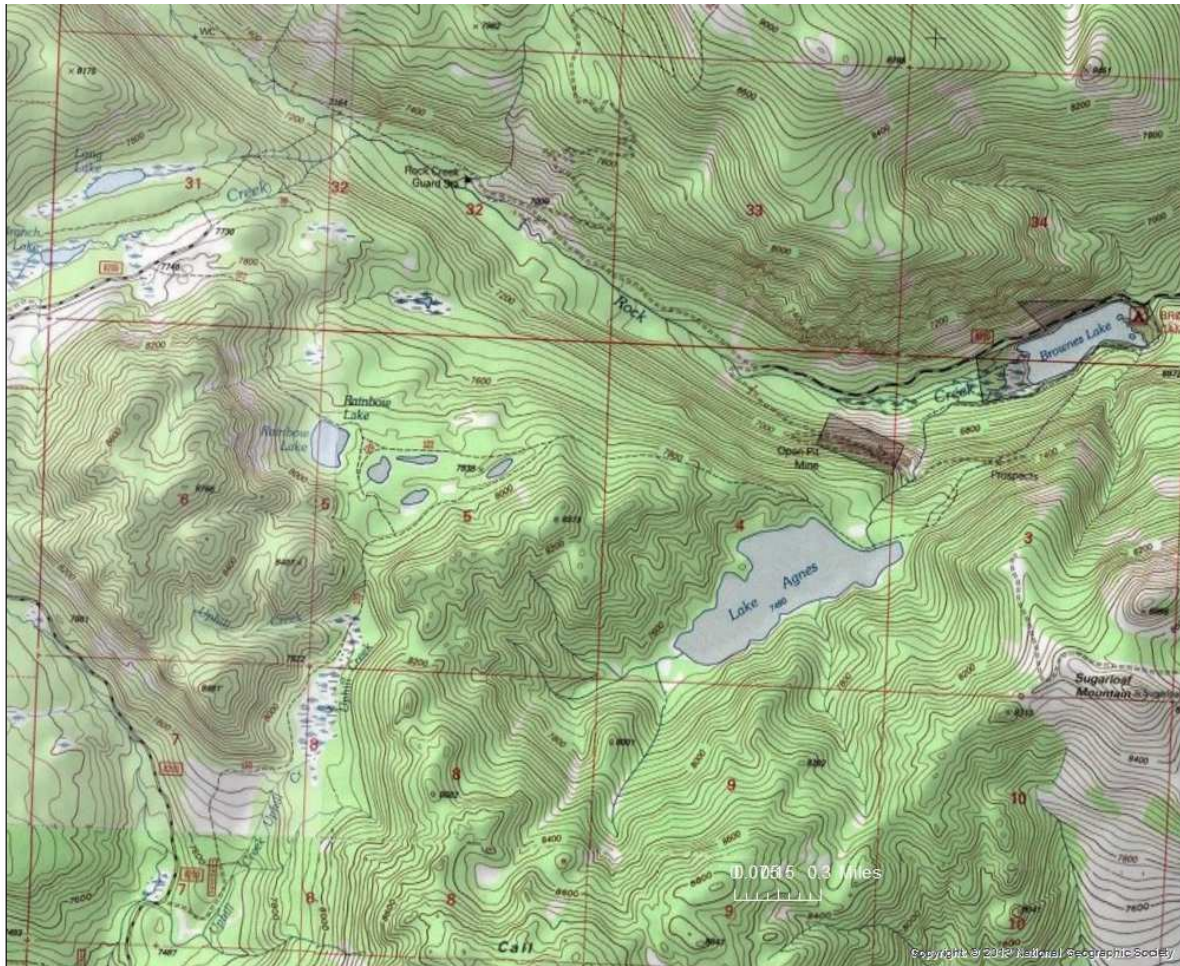


Figure 3. Map detailing Rainbow Lake and the surrounding area and lakes.

Upper Lena Lake

Upper Lena Lake is located in the Beaverhead Mountains (West Big Hole) west of the town of Jackson, Montana. The lake is located in the Big Swamp Creek drainage at an elevation of 8,587 ft. Although Upper Lena Lake is fishless, there are 3 additional lakes in the drainage that contain self-sustaining populations of introduced trout. Hidden Lake contains a self-sustaining population of Yellowstone cutthroat trout, Ajax and Lower Lena Lake contain self-sustaining populations of rainbow trout (Olsen 2010). Additionally, Albino and 2 other unnamed lakes in the drainage are fishless (Olsen 2010). Big Swamp Creek contains a brook trout fishery. Upper Lena Lake has a mostly rocky shore line with limited littoral area. The outlet of the lake flows northeast into Lower Lena Lake. The lake appears to be greater than 15 ft deep but no depth measurements have been taken. The inlet and outlet stream contain very little potential spawning habitat because of the predominantly boulder substrate and therefore the potential for reproduction in the lake is limited. An amphibian survey was conducted at the lake and no amphibians were observed at the lake during a 2010 survey (Olsen 2010).

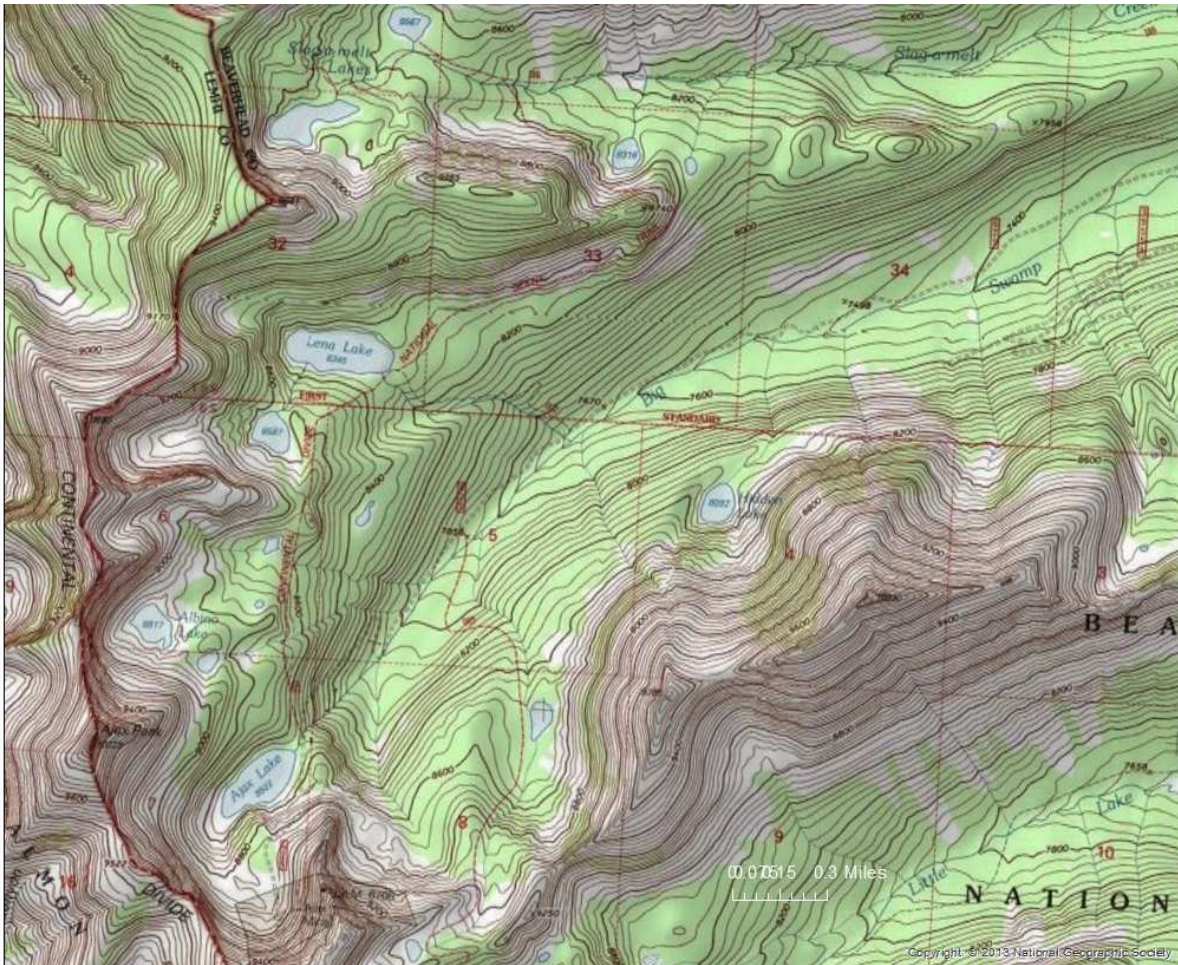


Figure 3. Map detailing area of Upper Lena Lake.

PART II. ALTERNATIVES ANALYSIS

Alternative 1: The "No Action" Alternative

If no action is taken, Foolhen and Rainbow lakes would continue to be stocked with westslope cutthroat trout on a four year basis and Upper Lena Lake would remain fishless. The former lakes would continue to provide high-quality fisheries for cutthroat trout. There would be no new impacts on aquatic invertebrates in Upper Lena Lake if the lake remained fishless. There also would be no increase in the diversity of mountain lake fishing opportunities in the Big Hole drainage.

Alternative 2: Proposed Action

If the proposed action is implemented, beginning in the summer of 2014 golden trout would be introduced to Foolhen, Rainbow and Upper Lena lakes. These fish would be packed into the lakes on backpacks and/or livestock. The lakes would thereafter be planted on a 6-year stocking

rotation and would be stocked from the ground. No additional impacts on the ecology of Foolhen and Rainbow lakes are anticipated with the proposed switch in trout species stocked from westslope cutthroat trout to golden trout because golden and westslope cutthroat trout occupy the same niche. The impacts to both invertebrate and potential vertebrate prey species should be the same and should be minimal given the long stocking history in each of these lakes.

The introduction of fish to previously fishless lakes, such as Upper Lena, can have impacts on invertebrate communities and lower trophic levels as a result of predation and cascading impacts (Matthews 1998). In mountain lakes these impacts are noted by the decrease in size of prey available and sometimes a shift in the abundance of some species. However, rarely has there been any documentation of extirpation of species. There will likely be some impacts to invertebrates in Upper Lena Lake as a result of fish introduction because the lake is currently fishless. These impacts will be mitigated by the low stocking rate of the lake and extended stocking frequency (6 years instead of the more common 4 years). This stocking schedule will result in primarily a single age class of fish being present in the lake at one time. A single age class of fish should have fewer impacts than multiple age classes (i.e., sizes) of fish on prey species because prey size and type often change as a fish grows. Smaller fish feed on smaller prey and larger fish feed on larger prey; therefore with only a single age class of fish present in the lake there will be variable rates of predation for varying sizes in the years following fish introduction. Previous undocumented records indicate that Upper Lena Lake supported a rainbow or cutthroat trout fishery at one time (USFS 1992). If these records are true, it is likely that the impacts of golden trout introduction would be similar to those of the past fishery and therefore, the introduction of fish to the lake would be only a minor and temporary impact to potential prey species. If fish stocking were discontinued the native invertebrate structure present without fish would likely return to the lake. Further, there are other similar fishless lakes in the immediate area (Albino Lake and 2 other unnamed lakes) that are similar in size and would remain fishless.

The introduction of fish to previously fishless lakes has been shown to have impacts on amphibians such as frogs and salamanders (Matthews 1998). However, amphibian surveys at Upper Lena Lake indicated there were no amphibians present. The high elevation and lack of well developed littoral area likely contribute to the natural lack of amphibians.

One of the reasons the lakes proposed for golden trout introduction were selected was because they lie in drainages that have no conservation population of native westslope cutthroat trout and no plans in the immediate future to perform cutthroat restoration projects. Because the 2 species are closely related, golden trout can hybridize with westslope cutthroat trout and their offspring are fertile. Therefore drainages that contain native cutthroat populations and those may be candidates for cutthroat trout restoration are not considered potential introduction sites for golden trout. There will be little potential for golden trout to hybridize with the stocked cutthroat trout in Foolhen and Rainbow lakes because there is no natural reproduction in the lakes.

It is possible that the introduction of golden trout to these lakes would attract additional angling pressure and human impacts at the lakes. This may particularly be true in Foolhen Lake where an unauthorized pioneered road is present to the lake. Because golden trout are not common and because of their unique coloration, they are sometimes specifically targeted by backcountry anglers. Coordination with Beaverhead Deer Lodge National Forest who manages the land where

the lakes reside would occur to reduce any potential impacts of unauthorized use. All 3 lakes have well maintained trail systems that provide public access to the lakes. Any potential increase in use should be minor given the remote nature of the lakes and existing infrastructure providing access.

The proposed action would increase angler opportunity to catch golden trout in the Big Hole drainage and southwest Montana. The potential impacts on aquatic and terrestrial life of the proposed golden trout introduction range from none in Foolhen and Rainbow lakes to minor and temporary in Upper Lena Lake. There are few potential impacts to non-living terrestrial resources and these impacts can be mitigated through proper enforcement of existing regulations.

Alternative 3: Discontinue Stocking and Allow Foolhen and Rainbow lakes to Become Fishless.

All 3 lakes proposed for golden trout introduction were historically fishless. Another alternative would include discontinuing the current stocking of westslope cutthroat trout in Foolhen and Rainbow lakes and allow them to revert to their original fishless state. Because there is no natural reproduction in either of these lakes the fish would eventually die off and the lake would become fishless in 6-10 years. Allowing the lakes to become fishless would likely lead to a change in the invertebrate communities of the lake. Fish predation on invertebrates can impact the number, size and types of invertebrates present in alpine lakes which in turn affect plant (primarily algae in this case) communities. It is likely that the lake would return to a state similar to what existed before fish were introduced. The loss of the fisheries in the two fish bearing lakes would likely have substantial impact to angling in the area because the lakes have a reputation for producing large fish and are popular destination for backcountry lake anglers.

1. POTENTIAL IMPACT ON THE ENVIRONMENT THE OF PROPOSED ACTION

Will the project result in potential impacts to:	Unknown	Potentially Significant	Minor	None	Can Be Mitigated	Comments Provided
1. Unique, endangered, fragile or limited environmental resources				X		
2. Terrestrial or aquatic life and/or habitat			X		Yes	1.2
3. Introduction of a new species into an area			X		Yes	1.3
4. Vegetation cover, quantity and quality			X		Yes	1.4
5. Water quality, quantity and distribution (surface or groundwater)				X		
6. Existing water right or reservation				X		
7. Geology and soil quality, stability and moisture			X		Yes	1.7
8. Air quality or objectionable odors				X		
9. Historical and archaeological sites				X		
10. Demands on environmental resources of land, water, air & energy				X		
11. Aesthetics				X		

Comments

1.2. Terrestrial or aquatic life and/or habitat

The introduction of golden trout will have direct impacts on invertebrate and vertebrate organisms through predation. However, because there are existing westslope cutthroat trout fisheries in Foolhen and Rainbow lakes, the potential impacts of golden trout stocking on invertebrate and vertebrate populations should be minimal and similar to those of the existing fishery. In Upper Lena Lake which is currently fishless (purportedly contained a trout fishery at one time) there will likely be impacts on aquatic invertebrates that were previously not preyed upon. These impacts will likely result in a change in abundance for some prey species and a decrease in size for others (Mathews 1998). However, it is unlikely that the introduction of golden trout will result in the extirpation of aquatic species in Upper Lena Lake. The impacts on invertebrates will be mitigated through stocking fish at a lower rate (100 fish per acre) and

stocking at a reduced frequency (every 6 instead of the typical 4 year frequency). There should be no affect on amphibians since there were none found during a survey of the lake (Olsen 2010).

1.3. Introduction of a new species into an area

Golden trout are not native to Montana; however they have been commonly stocked throughout western and southwestern Montana, primarily in mountain lakes. This proposed introduction should have no potential for impacts on other fish species because of the lack of reproduction that will occur at the lakes. There is little chance of the fish leaving the lakes and colonizing the streams downstream because of the lack of reproduction and limited habitat in outlet streams. Further, if golden trout were to migrate downstream there should be few if any impacts to the stream fisheries. The lakes considered for golden trout introduction are in drainages where there are no conservation populations of westslope cutthroat trout nor any plans to restore the species to the drainages (See also comment 1.2.). Also, all the streams downstream of the proposed lakes have non-native fish communities and so there should be no additional impacts if golden trout moved downstream.

1.4. Vegetation cover, quantity and quality

It is possible the creation of a golden trout fishery may attract additional use at the 3 proposed lakes for stocking. Currently there are established trails to all 3 lakes. At Rainbow and Upper Lena lakes there should not be significant additional impacts associated with potential increased use. Both lakes are an easy day hike from established trailheads and therefore an overnight stay is not required to access and fish the lakes. There is no motorized access to either lake. There are existing camp sites at Rainbow Lake and at Lower Lena Lake located less than a mile from Upper Lena Lake. There is no motorized access to Foolhen Lake but there is ATV access nearby on Trail 735 (Figure 1). Motorized users have pioneered a path from Trail 735 down to the Foolhen Lake. This pioneered path goes through a sensitive area with wet meadows near the lake and significant rutting has occurred. With golden trout in Foolhen Lake, motorized access nearby and a pioneered road, it is possible that additional unauthorized motorized use will take place causing further vegetation damage near the lake. FWP will work with the US Forest Service to reduce or prevent unauthorized motorized use and enforce current regulations to reduce or prevent further vegetation damage and erosion.

1.7. Geology and soil quality, stability and moisture

If the pioneered road into the Foolhen Lake receives additional traffic as a result of the introduction of golden trout, it is possible that erosion may be exacerbated. This pioneered trail descends at a steep grade and does not have active erosion protections installed to reduce trail erosion. However, because this is an unauthorized trail these impacts can be mitigated by preventing further unauthorized motorized use (See comment 1.4). There are no anticipated impacts to soil or geology as a result of golden trout introduction in Rainbow or Upper Lena lakes as both lakes have good trail access.

2. POTENTIAL IMPACTS ON HUMAN ENVIRONMENT

Will the project result in potential impacts to:	Unknown	Potentially Significant	Minor	None	Can Be Mitigated	Comments Provided
1. Social structures and cultural diversity				X		
2. Changes in existing public benefits provided by wildlife populations and/or habitat			X		Yes	2.2
3. Local and state tax base and tax revenue				X		
4. Agricultural production				X		
5. Human health				X		
Quantity and distribution of community income				X		
7. Access to and quality of recreational activities			X		Yes	2.7
8. Locally adopted environmental plans & goals				X		
9. Distribution and density of population and housing				X		
10. Demands for government services				X		
11. Industry and/or commercial activity				X		

Comments

2.2. Changes in the existing public benefits provided by wildlife populations and/or habitat

By establishing a population of golden trout in the 3 proposed lakes, the recreational opportunities to catch golden trout will increase. This fish is rare in the Big Hole drainage and introduction to these lakes will greatly increase the opportunities for anglers to catch this fish. Further, in Foolhen and Rainbow lakes the introduced golden trout may have the capability of growing to trophy size. The discontinuing of stocking of westslope cutthroat trout into Foolhen and Rainbow lakes will result in the loss of some angler opportunities for this species. However, there are still over 25 lakes in the Big Hole with stocked westslope populations. It is anticipated that growth and longevity of golden trout should be similar to if not better than that of westslope cutthroat trout, so the quality of the fishery should not change (See 2.7 below).

2.7. Access to and quality of recreational activities

There would be no change in access to recreation as a result of the introduction of golden trout to Foolhen and Rainbow lakes. Introduction of golden trout to Upper Lena Lake would represent an increase in the opportunities for angling because the lake is currently fishless. There would be no proposed changes in angling regulations at the 3 lakes as a result of the proposed action. In lakes in of the central region of Montana, golden trout are part of an individual's combined trout limit (5 daily and in possession at Foolhen Lake and 5 daily and 10 in possession at Rainbow and Upper Lena lakes) and therefore there will be no reduction in the opportunity to harvest fish from the lakes.

Does the proposed action involve potential risks of adverse effects that are uncertain but extremely harmful if they were to occur?

No

Does the proposed action have impacts that are individually minor, but cumulatively significant or potentially significant?

No. FWP concludes from this review that the proposed activities will have no significant impacts based upon the criteria at ARM 12.2.431 to determine the significance of an impact. Therefore, an EIS is not warranted and an environmental assessment is the appropriate level of review.

Evaluation and listing of mitigation, stipulation, or other control measures enforceable by the agency or another government agency:

US Forest Service land use and forest management plan will provide land management of the project areas.

Individuals or groups contributing to, or commenting on this EA:

Prepared by : Jim Olsen, Fisheries Biologist_____ **Date:** ____April 24, 2014_____

Submit written comments to:

Montana Fish, Wildlife & Parks
c/o Golden Trout EA
1820 Meadowlark Ln.
Butte, MT 59701

Comment period is 30 days. Comments must be received by May 27, 2014

References

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